

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

**Listing of Claims:**

1. (Currently Amended) A method comprising:

obtaining an output signal sequence from a partial response channel, the output signal sequence comprising a waveform of widely varying amplitude;

determining an input sequence of the partial response channel by maximizing cross-correlation of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and

providing an output corresponding to the determined input sequence;

wherein said determining the input sequence comprises employing Viterbi detection using a cross-correlation branch metric, the Viterbi detection providing a robust tolerance of phase uncertainty with the waveform of widely varying amplitude including providing accurate detection decisions even when the amplitude of the waveform is very small; and

wherein the partial response channel has a transfer function defined according to a target polynomial,  $T(D) = p_0 + p_1D + \dots + p_M D^M$ , the Viterbi detection operates according to a trellis having  $2^M$  states, and all survivor paths associated with all the  $2^M$  states in the trellis merge in  $M$  steps; and

wherein the target polynomial is scaled by a gain factor, and said determining ignores the gain factor.

2. (Canceled)

3. (Canceled)

4. (Original) The method of claim 1, wherein said providing the output corresponding to the determined input sequence comprises providing the determined input sequence to an additional sequence processing component.

5. (Original) The method of claim 1, wherein the output signal sequence comprises a convolution of the input sequence and a target polynomial of the partial response channel.

6. (Original) The method of claim 1, wherein the partial response channel comprises a data storage medium, and said obtaining the output signal sequence comprises sampling a signal generated from the data storage medium.

7. (Currently Amended) A machine-readable medium embodying information indicative of instructions for causing one or more machines to perform operations comprising:

obtaining an output signal sequence from a partial response channel, the output signal sequence comprising a waveform of widely varying amplitude;

determining an input sequence of the partial response channel by maximizing cross-correlation of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and

providing an output corresponding to the determined input sequence;

wherein said determining the input sequence comprises employing Viterbi detection using a cross-correlation branch metric, the Viterbi detection providing a robust tolerance of phase uncertainty with the waveform of widely varying amplitude including providing accurate detection decisions even when the amplitude of the waveform is very small; and

wherein the partial response channel has a transfer function defined according to a target polynomial,  $T(D) = p_0 + p_1D + \dots + p_M D^M$ , the Viterbi detection operates according to a trellis having  $2^M$  states, and all survivor paths associated with all the  $2^M$  states in the trellis merge in  $M$  steps: and

wherein the target polynomial is scaled by a gain factor, and said determining ignores the gain factor.

8. (Canceled)

9. (Canceled)

10. (Original) The machine-readable medium of claim 7, wherein providing the output corresponding to the determined input sequence comprises providing the determined input sequence to an additional sequence processing component.

11. (Original) The machine-readable medium of claim 7, wherein the output signal sequence comprises a convolution of the input sequence and a target polynomial of the partial response channel.

12. (Original) The machine-readable medium of claim 7, wherein the partial response channel comprises a data storage medium, and said obtaining the output signal sequence comprises sampling a signal generated from the data storage medium.

13. (Currently Amended) An apparatus comprising:

a branch metric generator that generates branch metrics comprising a cross-correlation of obtained output sequences and estimated output sequences for a partial response channel;

an add-compare-select component that compares paths and determines survivor paths using generated branch metrics;

a memory that retains metrics information; and

a trace-back component that determines a best path of the survivor paths and outputs sequence information based on the determined best path;

wherein the partial response channel has a transfer function defined according to a target polynomial,  $T(D) = p_0 + p_1 D + \dots + p_M D^M$ , the branch metric generator operates according to a trellis having  $2^M$  states, and all the survivor paths merge in  $M$  steps; and  
wherein the target polynomial is scaled by a gain factor, and the branch metric generator ignores the gain factor.

14. (Original) The apparatus of claim 13, wherein the add-compare-select component compares paths and determines survivor paths by maximizing a quantity defined according to an equation,  $\sum_{k=0}^N y_k \cdot y_k^*$ , where  $N$  corresponds to a sequence length,  $y_k$  corresponds to a real channel output, and  $y_k^*$  corresponds to an estimated channel output.

15. (Canceled)

16. (Previously Presented) The apparatus of claim 13, wherein the memory comprises a path memory of length  $M$ .

17. (Currently Amended) An apparatus comprising:  
means for obtaining an output signal sequence from a partial response channel;  
means for determining an input sequence of the partial response channel by maximizing cross-correlation of an estimated output sequence with the obtained output sequence, the estimated output sequence being estimated based on the partial response channel; and  
means for providing an output corresponding to the determined input sequence;  
wherein said means for determining comprises Viterbi means for generating a cross-correlation branch metric; and  
wherein the partial response channel has a transfer function defined according to a target polynomial,  $T(D) = p_0 + p_1 D + \dots + p_M D^M$ , the Viterbi means operates according to a trellis having  $2^M$  states, and all survivor paths associated with all the  $2^M$  states in the trellis merge in  $M$  steps; and  
wherein the target polynomial is scaled by a gain factor, and said means for determining ignores the gain factor.

18. (Canceled)

19. (Canceled)

20. (Original) The apparatus of claim 17, wherein the partial response channel comprises a data storage medium.

21. (Currently Amended) A system comprising:

an input line that provides a sampled channel sequence; and

Viterbi detection means for determining a recovered sequence from the sampled channel sequence, the Viterbi detection means including means for maximizing cross-correlation of the recovered sequence and the sampled channel sequence;

wherein the sampled channel sequence comprises a waveform of widely varying amplitude, and the Viterbi detection means provides robust tolerance of phase uncertainty with the waveform of widely varying amplitude including providing accurate detection decisions even when the amplitude of the waveform is very small; and

wherein the sampled channel sequence corresponds to a partial response channel having a target partial response that is scaled by a gain factor, and the Viterbi detection means ignores the gain factor.

22. (Canceled)

23. (Original) The system of claim 21, further comprising a head-disk assembly comprising the input line.

24. (Currently Amended) A data storage system comprising:  
an input line that provides a sampled channel sequence from a data storage medium; and  
Viterbi detection means for determining a recovered sequence from the sampled channel sequence, the Viterbi detection means including means for maximizing cross-correlation of the recovered sequence and the sampled channel sequence;  
wherein the sampled channel sequence comprises a waveform of widely varying amplitude, and the Viterbi detection means provides robust tolerance of phase uncertainty with the waveform of widely varying amplitude including providing accurate detection decisions even when the amplitude of the waveform is very small; and  
wherein the sampled channel sequence corresponds to a partial response channel having a target partial response that is scaled by a gain factor, and the Viterbi detection means ignores the gain factor.

25. (Canceled)

26. (Original) The system of claim 24, further comprising a head-disk assembly comprising the input line.